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► To cite this version:

Thierry Kangoye. Instability from trade and democracy: the long-run effect of aid. *Economics Bulletin*, 2008, 6 (41), pp.1-16. hal-00331902

HAL Id: hal-00331902

<https://hal.science/hal-00331902>

Submitted on 20 Oct 2008

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Instability from trade and democracy: the long-run effect of aid

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Abstract

Is there an effect of aid on democracy conditional on instability from trade ? This paper reinvestigate the debated effect of aid on democracy with a new specification. We take advantage of previous empirical findings explaining the role of aid in mitigating the adverse effects of external shocks, and argue that in the long term, aggregate aid flows can potentially dampen the effects of terms-of-trade instability on the quality of democracy. An empirical investigation with data from 70 developing countries (28 of them african countries) over the period 1980-2003 (pooled in two twelve-years periods) provides supportive results. Moreover, the data suggest that terms-of-trade instability affects democracy through income instability. These results are robust to alternative specifications and to the use of different measures of aid intensity and democracy.

I am grateful to Patrick Guillaumont, Philippe Dulbecco, The Ronald Coase Institute, ESNIE 2008 and CERDI for comments. I also thank Jean-François Brun for providing me with his data.

Citation: Kangoye, Thierry, (2008) "Instability from trade and democracy: the long-run effect of aid." *Economics Bulletin*, Vol. 6, No. 41 pp. 1-16

Submitted: August 30, 2008. **Accepted:** September 26, 2008.

URL: <http://economicsbulletin.vanderbilt.edu/2008/volume6/EB-08F40024A.pdf>

1 Introduction

The positive role of institutions on development has been widely assessed and confirmed; institutions cause fundamentally economic growth and development (Rodrik and al. 2004 ; North 1990 ; Hall and Jones 1999 ; Acemoglu, Johnson and Robinson 2001). The obvious next question for some scholars has been to know how countries acquire good institutions. Rodrik (2000) has explained that countries face two strategies to get their institutions right: copying well-functioning institutions from advanced countries (with a risk of failure, since institutions effectiveness is highly specific to local conditions), or taking advantage of local knowledge and engage in an experimentation process of institutional designs. But from another policy point of view, one can propose another formulation of strategies: as proposed by Rodrik (2000), a first strategy can suggest that countries invest directly their resources in institutional improvement (through experimentation and learning processes) [which can be costly for their current economic performance]. A second strategy can suggest that countries give preference to an indirect way of institutional building by investing their resources on the determining factors of the emergence of good institutions such as economic performance. As we will discuss in the next section, growth stability matters for institutional building. Here, external assistance can be given a role, which is the purpose of this research. As a matter of fact, recent studies on aid effectiveness have highlighted macroeconomic instability as a factor of aid effectiveness. Guillaumont and Chauvet (2001), Chauvet and Guillaumont (2004, 2007), Collier and Dehn (2001) and Collier and Goderis (2007) have shown that aid, by protecting growth against the negative effects of shocks, is more effective in vulnerable countries. The core assumption of our paper is based on these findings and can be formulated as follows: if one accepts that a stable growth is good for institutional building and that aid can make growth more stable by protecting it against shocks, so it will be possible to have a positive effect of aid on institutions in countries exposed to these shocks. So the question this research answers is important since reducing macroeconomic instability and its adverse effects is a great challenge for developing countries. We focus in this research on democracy, as measured by synthetic indexes. As a matter of fact, democracy is considered as a meta-institution which help to build better institutions and help societies to select good economic institutions from the available menu of them, and deliver higher-quality growth (more stable, better redistributed, more predictable) (Rodrik 1997 2000). Democracy has also gained importance with the worldwide diffusion of its ideology, which has induced a great deal of pressure for the underdeveloped world to adopt democratic forms of governments. We also focus on terms-of-trade instability and the first assumption we test is that terms-of-trade instability is a source of income instability which have negative effects on democracy. Developing countries indeed face a great instability in their terms-of-trade mainly because they are relying of exports of primary sectors and are dependent of world markets. Our second assumption is that aid has a positive effect on democracy conditional on terms-of-trade instability, through its "growth-stabilizing" effect. We use panel data from 51 developing and emerging countries¹ over the period 1980-1999 (pooled in two periods) and find evidence that aid mitigates the adverse effects of term-of-trade instability on democracy. The effect of aid on institutions conditional on instability is assessed through an interactive variable equal to the product of aid and terms-of-trade instability. We also use instrumental variables

¹See a complete list in appendix 2

to get the exogeneous variation in aid flows. The rest of the paper proceeds as follows: In Section 2 we discuss how terms-of-trade instability can lower democracy; Section 3 briefly gives an overview of the debated institutional impacts of aid. Section 4 explains how aid may have a positive impact on democracy conditional on terms-of-trade instability. Section 5 provides the empirical evaluation. Section 6 concludes. The appendix contains further information on the construction of the democracy indexes we use and the other variables.

2 How might instability affect democracy: some theoretical arguments

Few academic works deal explicitly with issues about causal relationships between macroeconomic instability (or its determining factors) and the quality of institutions. One interest of this paper is to explain how macroeconomic instability (more precisely terms-of-trade instability) can affect democracy. The well-known papers in the literature about macroeconomic instability and institutions has been interested in the reverse idea, that is the institutional causes of instability. However, the idea that is institutions can be affected by instability is also very important. So how can terms-of-trade instability affect the quality of democracy ? The main theoretical reasoning is that terms-of-trade instability affect negatively democracy by generating income instability (Easterly and Kraay 2000) and by lowering growth, wich has been proved to be unfavourable to democratic processes. Academic works interested in the economic causes of democracy have highlighted the level of development as one of the main determinants (Lipset 1959; Helliwell 1994). Nonetheless, while most of them has established a positive correlation between the level of growth and democracy, very few of them have discussed the quality and the nature of growth, and more specifically its stability. We support the view that terms-of-trade instability cause (*ceteris paribus*) growth instability which in turn, weaken democracy. But how growth instability can affect democracy ? Low economic development and high trade dependency have been found to be unfavorable for the installation and consolidation of democratic regimes. Terms-of-trade instability which can be seen as one of the symptoms of economic dependence, is a source of hight exposure to fluctuations in world markets and economic instability which penalize stabilization and legitimation of regimes (Huber, Rueschemeyer and Stephens 1993). About this point, Djankov, Montalvo and Reynal-Querol (2005) have explained that negative shocks bring pressure on governments to reduce democracy and checks and balances.

Sociopolitical instability in general and income instability in particular can also have a negative effect on democratic institutions. Uncertainty about ressources to be redistributed (arising from income instability) can give some incitement to elites in power to exclude competing political groups in order to maximize (in the present or in the future) their appropriation of resources. Uncertainty and instability can indeed give incentives to elites to engage in rent-seeking activities in "good times" (when income is high¹) if their objective is to smooth their private consumption accross time. This can result in a weak political competition and a therefore in a weak quality of democracy

¹Since instability can be viewed as an alternation of positive and/or negative shocks

3 The debated effect of aid on institutions and democracy

Disregarding any conditional effect of aid on the quality of institutions, several papers have examined the potential direct impact of aid on institutional development and have found different results about the nature of this impact, making them very debated.

Many of them have focused on legal institutions (rule of law, corruption, bureaucracy, contracts, property rights), others on economic and political institutions and have found that aid can have negative as well as positive effects on these institutions (see Alesina and Weder 2002; Knack 2001; Brautigam and Knack 2004; Knack and Rahaman 2004; Svensson 2000; Tavares 2003; IMF's World Economic Outlook 2005; Coviello and Islam 2006).

Regarding the specific effect of aid on democracy, empirical findings in the literature seem to be less debated. The general view of the relationship between foreign aid and democracy is that one of aid's purposes is to promote democracy in the developing world. Excepted the work of Djankov and al. (2005) which finds that aid have a negative effect on democracy, most of empirical papers conclude either to positive effects or simply to no effects. Djankov and al (2005) explain their findings by the fact that foreign aid could lead politicians in power to engage in rent-seeking activities in order to appropriate aid resources and to exclude other groups from the political process. This damage political institutions because they become less representative and less democratic.

The democracy-building efforts of aid donors potentially contribute to improve democratization by improving the learning of electoral processes (through technical assistance and conditionalities), and by improving human resources quality and income level (Knack 2004). This point is confirmed by Kalyvitis and Vlachaki (2005) who find strong evidence that political aid¹ (electoral and technical assistance) directed to democratization predict positively democratic transitions in recipient countries, when aggregate aid flows does not.

While most of empirical studies on aid and democratization have concluded to no effect of aid (Hoffman 2003; Knack 2004; Kalyvitis and Vlachaki 2005), some of them have found that aid could lead to better civil liberties, political competition and participation. Goldsmith (2001) supports this point by explaining that foreign aid, by improving health and literacy, make people more informed and aware of public politics, which improve the quality of democracy. Dunning (2004) demonstrates that foreign aid has a (small) positive effect on democracy in the post Cold War period.

To sum up, the main empirical studies about the direct effect of aid on democratic institutions conclude that aid has no effect on them, or at most has a positive effect on democracy. But what about the effect of aid on democracy conditional on exogeneous factors ?

4 The conditional effect of aid

The aid effectiveness literature focusing on macroeconomic instability and economic vulnerability of recipient countries provide us with the general intuition of this research. Indeed if one accepts the point that aid has proved to be more effective in vulnerable countries by protecting growth against external shocks (by making it more stable), so aid could therefore have an indirect effect on institutions in these countries through this channel.

¹The data they used is Government and Civil society Aid, provided by OECD

Guillaumont and Chauvet (2001), Chauvet and Guillaumont (2004, 2007) have shown that negative terms-of-trade shocks have adverse effects on growth and that aid is more effective in vulnerable countries by making growth more stable in the medium term. They explain that in cases shocks occur, aid smoothes public expenditures and limit the risk of fiscal deficits. The indicator of vulnerability they use allow them to conclude that the level of aid is likely to cushion the negative effects of external shocks on economic growth¹. Collier and Goderis (2007) have pursued this idea and have shown that the level of aid lower the negative effect of commodity export prices shocks on growth because aid finance precautionary expenditures which reduce vulnerability to shocks. Collier and Dehn (2001) have focused on export price shocks to explain aid effectiveness and have shown that while positive shocks are insignificant in the growth process, negative shocks reduce growth and the interaction between them and offsetting increase of aid is significantly positive. This means that aid mitigates the negative effects of terms-of-trade deterioration on growth. Elsewhere, Easterly and Kraay (2000) have shown for small states that because of their greater openness, terms-of-trade shocks volatility is a source of growth instability. We can generalize this point to under developed countries since they are also highly dependent to trade and their exports are more specialized. In previous sections, we have provided some arguments explaining that growth instability is not good for institutions partly because a stable growth allow quality institutions to emerge. We deduce from this point that all causes of stable growth are indirect causes of the emergence of good institutions. So, if aid reduce growth volatility, it can also protect institutions in situation of instability.

To put things briefly, our main theoretical prediction is that aid, by mitigating the adverse effects of shocks on growth could have a positive conditional effect on democracy (*ceteris paribus*). The next sections provide an empirical evaluation of this prediction.

5 Specification, causalities and results

5.1 The econometric model and the identification strategy

Our econometric model includes as main controls², net aggregate Official Development Assistance, terms-of-trade instability, and an interaction term equal to the product of aid and terms-of-trade instability. This later variable allow us to test the dampening effect of aid. We write the baseline model as follows:

$$Democ_{it} = \alpha + \beta I_{it} + \gamma A_{it} + \kappa A_{it} \times I_{it} + \omega X_{it} + \nu_{it} \quad (1)$$

where $Democ_{it}$ is an index of democracy, A_{it} is the aid variable, I_{it} is terms-of-trade instability and $A_{it} \times I_{it}$ is the interaction term between aid and terms-of-trade instability. X_{it} is a vector of controls including geography, education, ethnolinguistic fractionalization,

¹in Guillaumont and Chauvet (2001), the indicator of vulnerability takes into account the size of population, the instability of exports agricultural production, while in Chauvet and Guillaumont (2004), it only takes into account exports instability and the negative trend of terms-of-trade. Since (exogenous) terms-of-trade instability is also a source of vulnerability (which causes a risk on growth), the growth-stabilization effect of aid can also be valid for this type of instability.

²See appendix for a more detailed description and definition of the data

initial conditions, estimated settler mortality rate, life expectancy, and an african dummy variable¹. i and t stand respectively for countries and time periods. Democracy in a country is indeed a function of many factors. Ethnic diversity (proxied by ethnolinguistic fractionalization) is often assumed to have an effect on political freedom and political competition, since democracy is less likely to prevail in countries which are socially divided and which lack cultural and linguistic coherence (Lijphart 1977; Horowitz 1993). Socioeconomic development (that we proxied by the purchasing power parity estimate of income per capita, and education) has long been believed to be conducive to the emergence or survival of democracy. Democracy can also be explained by geographical characteristics which are a good control for climatic conditions and contagion effects, and which may predict political regime classification. Initial economic conditions (proxied by initial level of per capita income) also matter for democracy, since they are assumed to determine the initial quality of democracy (and therefore current, because of the persistence of institutions). So, we anticipate positive estimated coefficients of the interaction term, geography, education, and negative coefficients of instability, and fractionalization. Since we focus on long-run effects of aid and instability, and because democratization is a long-term process, we average our variables on twelve-year periods (1980-1991 and 1992-2003).

It is often argued that aid and democracy are endogenously related, since countries which make progress in their democratization process are able to attract more aid ("conditionality" argument), as some donors reward recipients with better democratic performances with more aid. The econometric estimation of a such model facing reverse causality between aid and institutions requires to deal rightly with endogeneity. As demonstrated by Wooldridge (2006) Ordinary Least Squares (OLS) estimation of a such model produce biased and inconsistent estimators. Although, in principle, the endogeneity problem can be avoided by applying instrumental variable techniques, the fundamental problem is that there are no ideal instruments available. A good instrument in this case would be a variable which is highly correlated with aid but not with the error term in the regression. Nevertheless, we have tried to control for the aid endogeneity problem by using as excluded instruments, the amount of official development assistance and the grants of the five main donors (identified each year), weighted by the distance between the donor and the recipient. We assume terms-of-trade instability to be exogeneous²; as a matter of fact, most of developing countries rely on their primary sectors exports and are price takers on the world markets. Moreover, the principal international markets for developing countries exports are the advanced industrial countries on which developing countries also rely regarding their imports. Thus, terms-of-trade shifts are determined exogeneously, by the level of international demand in the short run and technical change and habits in the longer term. Finally, we use the predicted value (exogeneous component) of aid from the first-stage regression to compute the interactive variable between aid and terms-of-trade instability to get the real exogeneous component of it. So, the econometric model we estimate can be written as follows:

¹Appendix give a precise description of all of these variables

²Unfortunately, it remains difficult to test the endogeneity of this variable, because of the availability of good instrumental variables.

$$Democ_{it} = \alpha + \beta I_{it} + \gamma \hat{A}_{it} + \kappa \hat{A}_{it} \times I_{it} + \omega X_{it} + \epsilon_{it} \quad (2)$$

where \hat{A} is the predicted value of aid from the first-stage regression. $Democ_{it}$, I_{it} , X_{it} keep the same meaning as in equation 1. ϵ_{it} is the error term.

5.1.1 Findings

Table 3 presents the main results. In equations 1, 2 and 3, the dependant variable is the quality of democracy, measured by the polity2 combined index of democracy and autocracy. All of our estimations include country fixed effects to take into account country-specific heterogeneity. The aid variable is aid per capita in the three specifications. Equation (1) is the baseline specification and includes as controls, geography, education, ethnolinguistic fractionalization, and initial income. According to the findings of previous studies, the effect of aid on democracy is not significantly different from 0, even if the coefficient is negative. Unsurprisingly, an increase in terms-of-trade instability is associated with a significant decline in democracy, which confirms our theoretical expectations; an increase of 1% of the instability variable leads ceteris paribus to a decrease of 0.51% of the quality of democracy. More interestingly, we find that aid dampens the effect of instability on democracy. This effect is showed by the positive and significant coefficient of the interactive variable, explaining that as instability increases, the effect of aid on the quality of democracy becomes positive. This coefficient is however small and about .005. Among the control variables, education is the most powerful predictor of democracy. As expected, its coefficient is positive and significant. Geography and initial income are not significant. Only ethnolinguistic fractionalization has not the expected sign, and is significantly different from 0. In equations 2 and 3, we include in the regression for robustness, other possible determinants of democracy that are the estimated mortality of european settler, initial income and a dummy variable for africa. The african dummy controls for group specific effects; life expectancy allows a better control for socioeconomic development, and settler mortality control for historical conditions. As a matter of fact, Acemoglu, Johnson and Robinson (2001) have explained that the different environments (from the point of view of their hospitality) european colonists faced fundamentally influenced the types of long-lasting institutions they created. We find that these specifications does not change the main findings, and that the coefficients of interest are stable. Aid remains not significantly related to democracy; Increase in instability still leads to a decrease of democracy, and aid has still a dampening effect. In equation 3, except settler mortality which has no the expected sign (but is weakly significant), all others significant variables have the right sign: geography, education, and initial income predict positively democracy, while having a high fractionalization index and being an african countries predict negatively democracy. The Hansen overidentification test confirm the quality of instrumental variables for aid, since all associated p-values are above 10%.

Equations 1 and 2 of Table 4 attempts to explain the dampening effect of aid according to our theoretical expectations, that is terms-of-trade instability is a source of income instability and aid dampens the negative effect of the primer because it makes growth more stable. In equation 1, we test the direct effect of terms-of-trade instability on democracy, with the same set of control variables, and confirm its negative effects. In equation (2), we include in

the regression, income instability¹. As expected, while the effects of terms-of-trade instability remains negative and far from significance, the coefficient of income instability variable which is about -2.95, is negative and significantly different from 0. Because we suspect income instability to be endogeneous to democracy (since it may depend of many internal factors correlated with the quality of democracy), we instrument it. As a matter of fact, Rodrik (1997) has shown that democracies produce greater stability in economic performance. Since the amount of foreign direct investments (henceforth FDI) is a strong predictor of the level of development and income, and is not obviously related to democracy, we use FDI instability as instrumental variable for income instability. The Hansen overidentification test confirm the quality of instrumentation. Among the control variables, except life expectancy, all of them have the expected sign, even if only geography and settler mortality are significantly different from 0. This result shows that income instability is a transmission channel of the effect of terms-of-trade instability. To come back to our question of interest, if the negative effect of terms-of-trade instability on democracy is channeled through income instability, so, aid may have a dampening effect, since some authors have shown that it makes income growth more stable.

Finally, we have tested the robustness of our main results regarding the use of another democracy index (the Freedom House index of democracy²), the use of another measure of aid intensity (net official development assistance over GDP), and the use of different temporal periods (8-years periods). Our main results which are summarized in equations 1, 2 and 3 of table 3, stand. Except geography and settler mortality which have not the expected sign, terms-of-trade instability remains detrimental for the quality of democracy and aid remains stabilizing, while having no direct effect on democracy.

6 Concluding remarks

Aid does neither promote nor undermine democratic processes, but have a indirect positive effect on democracy in the long term by dampening the adverse effects of terms-of-trade instability. While the debate about how external assistance could improve political institutions, this study finds that aggregate aid flows mitigate instability from trade and protect democracy, and this is probably because aid makes growth more stable, as shown by some recent studies (Guillaumont and Chauvet 2001, 2004; Chauvet and Guilaumont 2007; Collier and Goderis 2007). We have also shown that terms-of-trade instability is a source of income instability which have a negative effect on democracy. So, to get back to the development strategies we presented in introduction, foreign aid can be useful in promoting institutions through their determinants. However, in a context of a debate about how to significantly increase aid in developing countries to reach the Millenium Development Goals by 2015, the findings from this study must not be interpreted as a calling for a big push of aid. As a matter of fact, even if democracy is considered as a meta institution, others types of institutions (legal and economic institutions) also matter for growth and development, and numerous studies have shown that they can be severely damaged as a result of large amounts of aid.

¹computed with the same methodology used for the calculation of terms-of-trade instability

²As illustrated by figure 1 in appendix, the polity2 and the Freedom House indexes are in close agreement over the period 1977-2003.

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APPENDIX A: Description of democracy indicators from Freedom House and Polity IV

A. The Freedom House democratic index

The Freedom House index focuses on two aspects of democracy which are political rights and civil liberties. The methodology of assessing democracy consist in ranking each country regarding these two aspects, from 1 (worse democratic situation) to 7 (best democratic situation). Evaluations are made on the basis of the answers to a questionnaire submitted to actors from civil society, political world and the media, which are mostly non governmental organizations or press. Next, the synthetic index is computed by averaging the index of political rights (proxied through the election mode of the chief of executive and the existence of an electoral framework) and the index of civil liberties (proxied through the freedom of opinion, the freedom of believes, the freedom of association, the legitimate state and human rights, the autonomy of people and the economic rights). The questionnaire is made of 8 questions about political rights and 14 questions about civil liberties; the scale of each question goes negatively from 1 to 4. Finally, depending of the total score, the two index are given a note between 1 and 7.

B. The Polity IV democratic index (*polity2*)

The Polity IV project from the University of Maryland provide a database about several indicators of democracy (executive constraints, political participation, openness in recruitment, etc.). The *polity2* index is computed by summing an index of democracy (*DEMOC*) which is positively scaled from 0 to 10, and an index of autocracy (*AUTO*) which is positively scaled from -10 to 0. The (*DEMOC*) index of democracy assesses democracy on the basis of four criteria: competition in political participation, competition and openness in the executive recruitment, and institutional constraints on the executive power. For instance, to assess openness in executive recruitment, assessors will ask whether all people can potentially access to the power if elections are free, or whether the power are hereditary. For unstance, in order to assess executive constraints, assessors will be interested in the existence of a legislative power or a constitutional strenght. These informations are used to give a ranking for each variable. So, political participation will be coded by 3 in cases of competitive situations, by 2 in cases of transitional situations, and by 1 in cases of factional situations. The total score of these differents components of democracy will be the score for *DEMOC* variable. The *AUTO* index of autocracy which assesses political competition and respect for political liberties is computed with the same methodology. Thus, situations of repressed competitiveness of participation will be coded by -2, and situations of supressed competitiveness of participation will be coded by -1. The scale for the *DEMOC* variable goes positively form -10 to 0. In the end, the *polity2* synthetic variable is obtained by summing the two indexes and by normalizing situations that assessors have considered as impossible to assess like periods of political transitions.

APPENDIX B: The measure of instability

Our terms-of-trade instability variable measures the gap between the terms-of-trade and an estimated trend of terms-of-trade. Instability is indeed always measured over a reference which is often an estimated trend. This requires to make some assumptions about the nature of this trend. As a matter of fact, estimations can give wrong results is a deterministic trend is estimated whith a non-stationary variable. Because most of economic variables include a trend which is not purely stochastic, we assume that the trend in terms-of-trade is mixed (both deterministic and stochastic). Then, we get the predicted value of terms-of-trade (\hat{X}) by running the following regression on 12-year periods¹ (i refers to countries, t refers to years. X is the terms-of-trade variable and ϵ is the idiosyncratic error term).

$$X_{it} = \alpha + \beta X_{it-1} + \gamma t + \epsilon_{it} \quad (3)$$

¹So, we considerer 12-year trends

Afterwards, we compute for each period, an instability index by using the following formula (quadratic formula):

$$Instab_{ip} = 100 \cdot \sqrt{\frac{1}{T} \sum_{i=t_1}^{t_2} \left(\frac{X_i - \hat{X}}{\hat{X}} \right)^2} \quad (4)$$

where $T=t_2-t_1$ is length of periods p .

APPENDIX C: data description

Aid per capita¹ = Net aggregate official development assistance transfers (2004 \$US millions) per capita (*Source: author's calculations from Development Assistance Committee (DAC) online database and World Development Indicators, 2005*)

Aid%GDP¹ = Net aggregate official development assistance transfers (2004 \$US millions) as share of gross domestic product (*Source: author's calculations from Development Assistance Committee (DAC) online database and World Development Indicators, 2005*)

Polity2 index = Combined democracy and autocracy score, ranged from -10(full autocracy) to +10(full democracy). (*Source: Polity IV project*)

Freedom House index = Democracy index, ranged from 1(best democratic situation) to +7(worse situation). (*Source: Freedom House*)

Terms-of-trade instability = Net barter terms-of-trade instability (see appendix B for the calculation method). (*Source: author's calculation*)

Income instability = instability of GDP per capita (2000 US \$), computed with the calculation method described in appendix B (*Source: author's calculation*)

Geography = Distance from equator of capital city measured as abs(latitude)/90. (*Source: World Bank (2002)*)

Education = Literacy rate, adult total (% of people 15+). (*Source: World Development Indicators, 2005*)

Ethnolinguistic fractionalization = Probability that two persons randomly selected in the population don't belong to the same ethnic group. (*Source: Atlas Narodov Mira*)

Settler mortality = Natural logarithm of estimated european settlers' mortality rate. (*Source: Acemoglu, Johnson, and Robinson (2001)*)

Life expectancy = Life expectancy at birth, for total population (years). (*Source: World Development Indicators, 2005*)

Africa = Dummy variable taking value 1 if a country belongs to Africa, 0 otherwise. (*Source: author*)

Initial income = Natural logarithm of GDP per capita in 1980 (2000 US dollars and PPP). (*Source: World Development Indicators, 2005*)

Income growth = Natural logarithm of GDP per capita growth (2000 US dollars and PPP). (*Source: World Development Indicators, 2005*).

Countries sample (70 countries - African countries in bold characters)

Algeria, Argentina, Bahrain, Bangladesh, **Benin**, Bolivia, **Botswana**, Brazil, **Burkina Faso**, **Burundi**, **Cameroon**, **Central African Rep.**, **Chad**, Colombia, **Congo (Rep.)**, Costa Rica, **Ivory Coast**, Cyprus, Dominican Rep., Ecuador, **Egypt**, El Salvador, Fiji, **Ghana**, Guatemala, Honduras, India, Indonesia, Iran, Islamic Rep., Israel, Jamaica, Jordan, **Kenya**, Kuwait, Lao PDR, **Lesotho**, **Liberia**, **Malawi**, Malaysia, **Mali**, **Mauritania**, Mexico, **Morocco**, **Mozambique**, Nepal, Nicaragua, **Niger**, **Nigeria**, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, **Rwanda**, Saudi Arabia, **Senegal**, Singapore, Sri Lanka, **Sudan**, Syrian Arab Republic, Thailand, **Togo**, Trinidad and Tobago, **Tunisia**, Turkey, United Arab Emirates, Uruguay, Venezuela, **Zimbabwe**.

¹Aid includes grants and concessionary loans with a grant element of more than 25%. Military assistance is excluded.

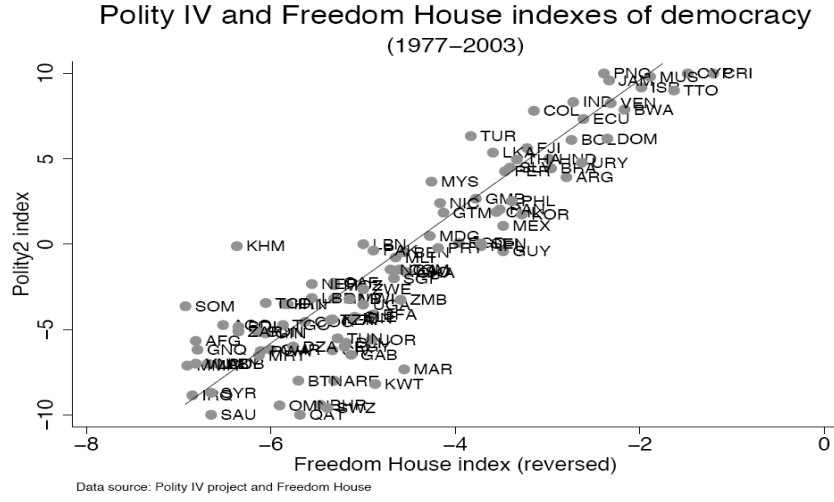
Table 1: Descriptive statistics

	Obs	Mean	Std. Dev.	Min.	Max.
A. Aid variables					
Net ODA per capita (US \$)	204	54.82	71.29	-2.40	485.52
Net ODA as percent. of GDP (%)	198	.106	.139	-.0002	.89
B. Institutional measures					
Polity2 index	203	-.86	6.41	-10	10
Freedom House index	204	4.61	1.59	7	1
C. Terms-of-trade					
Net barter terms-of-trade	150	113.37	42.39	26.25	397.54
Terms-of-trade instability (12 years trend)	150	9.53	9.33	7.63e-06	90.22
D. Countries characteristics					
Geography	204	16.84	10.92	0	39
Education	168	66.04	22.46	9.81	97.87
Eth. fractionalization	166	47.62	29.10	0	93
Settler mortality	138	4.90	1.06	2.43	7.98
Life expectancy	203	59.11	11.21	35.80	77.95
Africa	204	0.45	0.49	0	1
Initial income	174	2677.96	5898.56	126.35	46473.4
Income growth	193	0.88	0.65	-0.93	3.37

Table 2: Pairwise correlation matrix

	Aid per cap.	Aid%GDP	Polity2	Fr. House	tot ins.	Income ins.
Aid per cap.	1.00					
Aid%GDP	0.41*	1.00				
Polity2	-0.07	-0.22*	1.00			
Fr. House	0.02	-0.27*	0.88*	1.00		
tot ins.	-0.07	0.06	-0.13	-0.17*	1.00	
Income ins.	0.09	0.13	-0.18*	-0.19*	0.19*	1.00

Note:(*) 5% level significativity. Terms-of-trade instability and income instability are computed with 12-years trends.



X

Figure 1: Correlation between Freedom House and PolityIV democratic indexes

APPENDIX D: Findings

Table 3: Main results (aid per capita)

	Dependent variable: democracy (polity2)		
	(1)	(2)	(3)
Aid	-.07(-1.31)	-.0718(-1.31)	-.07(-1.32)
Terms-of-trade instab.	-.51***(-2.54)	-.512***(-2.54)	-.51**(-2.44)
Aid×instability	.005**(2.00)	.005**(2.00)	.005**(1.99)
Geography	-.02(-0.48)	.13(1.28)	.348*** (3.27)
Education	.25*** (3.23)	.25*** (3.23)	.25*** (3.13)
Eth. fractionalization	.12*** (6.16)	.08* (1.77)	-.07*** (-2.46)
Initial income	1.10(0.30)	1.77(0.50)	2.49(0.68)
Settler mortality		.24(0.17)	4.03* (1.88)
Life expectancy			-.0002(-0.00)
Africa			-13.8*** (-4.45)
Countries fixed effects	<i>yes</i>	<i>yes</i>	<i>yes</i>
R^2	0.86	0.86	0.87
Obs	88	88	88
<i>Overidentification test for aid instruments</i>			
Hansen J stat.	2.34	0.36	1.82
p-value	0.12	0.54	0.17

Notes: significance thresholds: (***)1%, (**)5%, (*)10%. Heteroskedasticity robust z-statistics in parentheses

Table 4: Democracy, term-of-trade and income instability

Dependent Var. : democracy (polity2)		
	<i>(1)</i>	<i>(2)</i>
Income instab.	-	-2.95***(-2.61)
Terms-of-trade instab.	-0.18***(-2.59)	-0.03(-0.33)
Geography	-0.61(-0.13)	-0.36***(-5.08)
Eth. fractionnalization	-1.05(-0.55)	-0.02(-0.50)
Log(trade)	1.35(1.02)	0.30(0.17)
Settler mortality	-69.41(-0.36)	-7.75***(-2.90)
Education	0.25***(-5.96)	-0.04(-0.62)
Life expectancy	-0.03(-0.33)	-0.51***(-2.74)
Initial income	16.64***(-3.91)	1.44(0.89)
Countries fixed effects	<i>yes</i>	<i>yes</i>
R^2	0.81	0.68
Obs	128	126
<i>Overidentification test for income instab. instrument</i>		
Hansen J stat	-	1.74
p-value	-	0.19

Notes: significativity thresholds: (***)1%, (**)5%, (*)10%. Heteroskedasticity robust z-statistics in parentheses. All instabilities are computed with 12-years estimated trends.

Table 5: Robustness checks

Dependent variable: democracy			
	<i>freedom house</i>	<i>aid%gdp</i>	<i>8-years periods</i>
Aid	-.027(-1.56)	-.099(-1.50)	-.061(-1.42)
Terms-of-trade instab.	-.18***(-2.97)	-.184***(-3.39)	-.054***(-2.74)
Aid×instability	.0016***(-2.38)	.007***(-2.90)	.003*(1.86)
Geography	.062*(1.86)	.028***(-2.18)	.068***(-2.34)
Education	.02(0.99)	.027(1.37)	.024(1.48)
Eth. fractionalization	.003(0.33)	-.013(-1.12)	.012(1.43)
Initial income	.84(0.94)	.94(1.02)	1.45**(-2.09)
Settler mortality	.41(0.72)	.77***(-2.43)	.74(2.04)
Life expectancy	-.05(-0.85)	-.09(-1.43)	-.01(-0.37)
Africa	-1.94**(-2.12)	-2.12***(-3.20)	-.63(-0.92)
Countries fixed effects	<i>yes</i>	<i>yes</i>	<i>yes</i>
R^2	0.85	0.85	0.82
Obs	88	88	131
<i>Overidentification test for aid instruments</i>			
Hansen J stat.	0.397	0.57	0.56
p-value	0.52	0.44	0.45

Notes: significativity thresholds: (***)1%, (**)5%, (*)10%. Heteroskedasticity robust z-statistics in parentheses